have already been approved for construction by the appropriate air pollution agency, but whose emissions and impact on air quality would not be included in the 1972 data base. Because it does not appear equitable to withdraw the construction approval from these sources, the 1972 baseline as defined in the proposed regulations consists of the measured or estimated air quality (or emissions) existing in 1972 as modified by the estimated impact of any source approved (prior to date of this proposal) for construction.

The selection of 1972 as the baseline year also introduces potential problems for a number of growth-oriented regions which improved their air quality in the period 1970–1972 to levels substantially superior to the national standards in anticipation of using that full increment to accommodate future economic expansion. The proposed regulations could substantially reduce that flexibility. The use of 1972 also tends to benefit those areas which were comparatively slow to implement emission reductions. These areas may now implement reductions in the future, and use the resulting air quality or emission increment for future economic expansion. Although this feature appears to penalize growth-oriented regions which implemented stringent controls to achieve air quality substantially superior to the national standards, the disadvantages of the alternative baseline concepts appear to be more significant. Hence, in all plans proposed herein requiring a baseline year, the year 1972 is used.

One or, possibly, some combination of the following four alternatives to prevent significant deterioration will be promulgated as Federal regulations to be enforced by the States until such time as each State possesses authority to enforce similar State regulations.

I. Air Quality Increment Plan

This section discusses a plan to prevent significant deterioration by establishing, for nationwide application, a maximum allowable increment in air quality above the baseline air quality. It is based upon the premise that "significant" deterioration can be defined as a finite increment in air quality, and that the resulting quantitative definition is appropriate for all sections of the country regardless of socio-economic conditions, and regardless of the current level of air quality (so long as national ambient air quality standards or other limitations are not exceeded). In addition to establishing this allowable increment, which is applicable to sulfur dioxide and particulate matter, the plan also incorporates the requirement common to all plans that all new or modified sources employ best available control technology.

Regulations which would implement this plan are proposed as the first set of alternative regulations in this notice. The regulations list the sixteen source categories for which deterioration review must be conducted, and also require the review of additional sources with potential emissions in excess of 4000 tons per year.

The definition of significant deterioration on which this plan is based consists of specific allowable increments to be added to the baseline air quality level. These increments are specified in the proposed regulations as:

For particulate matter:
- 10 $\mu g/m^3$ (annual average)
- 30 $\mu g/m^3$ (24 hour average)

For sulfur dioxide:
- 15 $\mu g/m^3$ (annual average)
- 100 $\mu g/m^3$ (24 hour average)
- 300 $\mu g/m^3$ (3 hour average)

The averaging times have been selected to be compatible with the existing secondary standards for these pollutants, and the times would be revised to be compatible with any revisions to the standards. This use of compatible time periods is necessary to insure maximum availability of baseline data, and also to facilitate incorporation of the deterioration review procedures into the existing new source review procedures.

Although there are no quantitative data to support the choice of any specific increment below the national standards, the increments proposed represent the Administrator's best judgment of increments which would prevent significant deterioration of currently clean areas, and yet not totally prevent the economic development of selected areas if that development were in the public interest.

If this proposed regulation were implemented, it would limit future development to the level of light industrial and residential complexes, or a very small amount of heavy industry such as stringently controlled power plants. For example, a recently constructed large apartment complex (15,375 units) in New York City is estimated to increase the 3-hour SO_2 concentration by 70 $\mu g/m^3$. This type of development would be allowed. A single well controlled large (1000–1500 MW) coal fired power plant can be expected to increase 24-hour SO_2 from 50 to 200 $\mu g/m^3$ depending on terrain conditions, the emission height and the dispersive characteristics of the atmosphere. The lower numbers represent typical values associated with construction in areas of good dispersion and relatively level terrain; a power plant of this type could be constructed to operate within the proposed criteria. The large increases represent plant construction in non-level terrain or areas of limited dispersion capability: If a plant were to locate in these areas a reduction in emissions beyond NSPS would be required. In general, most other types of sources would have a smaller impact on sulfur dioxide concentrations than a coal fired power plant and, if well controlled, could probably be constructed in most areas. However, in most areas if a source such as a power plant were constructed, the influence of emissions from this source would possibly raise the pollutant concentration over a large area (as great at 700 sq. miles) to a level which would be incompatible with any additional significant development.

The examples cited above assume that emission levels would be comparable to New Source Performance Standards. However, if a coal fired power plant used, for example, 80 percent efficient stack gas cleaning in addition to low sulfur (approximately 0.7 percent) coal, the 24-hour SO_2 increase could be limited to 10–40 $\mu g/m^3$, thus permitting construction of several sources. This example further emphasizes that prevention of significant deterioration need not necessarily prevent significant economic development so long as major emphasis is placed on improving emission reduction techniques.

The proposed regulations for this plan would require that all applicable new or modified sources submit comprehensive data to the State describing the source, the type and amount of projected emissions, the type of controls planned, the impact that the new or modified source would have on air quality, and an estimate of the existing air quality in the vicinity of the source. This information would be used by the State, subject to the Administrator's approval, to determine if the source would exceed the allowable air quality or emission limitations and to insure that the source plans to apply best available control technology. Prior to making this determination, the State would be required to provide opportunity for public comment on all information available.

In addition, the proposed regulations require that, unless the State determines that there is already an adequate air quality monitoring network in the vicinity, the source install a minimum of two continuous air quality monitoring instruments and one meteorological instrument in the areas of expected maximum concentration. This feature would assist in developing adequate air quality information for monitoring of the source's impact, and for analysis of the potential impact of proposed future sources to insure that the deterioration ceiling is not exceeded.

Unfortunately, the type of air quality data needed to accurately establish the baseline air quality is not currently available in many clean areas of the country. It would therefore become necessary to initially estimate this information by use of diffusion modeling and other appropriate techniques.

Despite the problems generated by lack of data in most very clean areas, this alternative has some generally desirable features. The increments proposed would not totally prevent economic development of all currently clean areas, but they would force large sources to employ increasingly effective control techniques, would provide the incentive for strong control technology research and development, would prevent construction in difficult terrain areas such as valleys or mountainous areas with poor dispersion characteristics, and would also prevent clustering of large sources with the potential for high localized pollutant concentrations.

The impact of this alternative on currently developed regions is more difficult to assess. As time progresses, improved control technology will cause significant

improvements in the air quality of currently developed areas and these areas will therefore be capable of absorbing more new development than the currently clean areas. This plan would therefore cause currently clean areas to remain relatively clean, but only at the expense of forcing new sources back into the more highly developed and populated areas.

A basic problem of this plan is the land use implications implied with no provisions to insure that they are in the best interests of the public or compatible with public desires. Inherent in any plan with a single deterioration definition applied nationally is the arbitrarily equal treatment of all equally clean areas. It may not be wise to restrict the development of waste lands to the same degree that a scenic national park is restricted, particularly if that restriction forces additional air quality deterioration on the heavily populated regions of the nation.

II. Emission Limitation Plan

This section discusses an alternative plan to indirectly prevent significant deterioration of air quality by preventing significant increases in emissions. Although the correlation between emissions and air quality is often difficult to establish, control of emissions may result in the same effects as are intended by preventing significant deterioration of air quality. Although the national ambient air quality standards are intended to adequately protect the public health and welfare from adverse effects, there are suspected effects that may be related more closely to total atmospheric loading than to specific ambient concentrations. These effects include visibility reduction; reduction in solar radiation reaching the ground; acidification of rain, lakes, and streams; conversion of sulfurous and nitrogenous emissions into sulfates and nitrates; and increases in "background" concentrations. None of these effects have been quantified to the extent that a precise relationship between pollutant emissions, pollutant concentrations, and the degree of adverse effects can be stated. There is, however, at least a qualitative basis for the prevention of significant increases in the load of pollutants carried by the atmosphere.

Atmospheric loading is poorly indicated by ground level concentration measurement due to the influence of meteorological dispersion and source location. Emission density (regional emissions/regional area) is an excellent indicator of atmospheric loading. Furthermore, emission data are more readily available and easier to acquire than air quality distribution data. Thus, emission density is a relevant and practical measure of, and means of control for, types of ambient air deterioration not presently limited by ambient air quality standards.

The calculation of emission density requires the choice of an area over which emissions are to be averaged. The regulations proposed for this plan specify an Air Quality Control Region (AQCR) as this area. There are several reasons for this choice. The AQCR is an established geographical subdivision for purposes of air quality analysis. Considerable data are available on this basis. Furthermore, an area of median AQCR size is necessary in order to provide the kind of development flexibility required with currently available technology. If the averaging area is too small, then no large source of source cluster could locate within it without violating the emission ceiling. A larger averaging area allows the location of a few such large sources because the total emission increase can be allocated to a small portion of the land (thus assuring that the remaining area will remain at low emission density).

It is recognized that AQCRs differ in size and that rigid adherence to the AQCR subdivision could lead to inequitable development opportunity; therefore it is anticipated that, if this proposal is promulgated, States would develop procedures to permit subdivision of large AQCRs and aggregation of small ones. This would also permit relatively pollution free portions of Priority I and II AQCRs to be included in the regions covered by this plan during the AQCR size adjustment process. As the proposed regulations are currently written, this plan would apply only to Priority IA and III AQCRs.

Given the size of an AQCR or averaging region, the baseline annual emissions of sulfur dioxide and particulate matter can be determined. A ceiling emission rate is then calculated by adding either 20% to the baseline emissions, or by calculating a ceiling based on emission density, whichever is larger. This establishes the emission limits for the region. Implementation of this plan would then consist of insuring that the total annual emissions from the region remained below the established emission ceiling.

The incremental increase is difficult to select due to a deficiency of relevant data and theory on the relationship between emission density, atmospheric loading, and the effects to be limited. The emission density factors included in the proposed regulations are 10 tons/year/sq. mile for sulfur dioxide and 3 tons/year/sq. mile for particulates. No AQCR with sulfur dioxide emission densities below these has exhibited air quality poorer than secondary national standards. Particulate emission densities display no general correlation of this type. However, most relatively clean areas have man-made particulate emissions below this level. It should be noted, however, that sulfur dioxide emission densities as high as 200 tons/year/sq. mile may be compatible with Priority III status. The poor correlation between emission density and measured air quality is due to the effect of meteorological factors and source location, as mentioned earlier.

Given the size of the region the allowable emission density factor or percentage increase and the baseline emissions, the emission ceiling for each region can be calculated. The resulting ceilings apply to *all* emitters in the region. For practical reasons, only the large sources included in the proposed regulations must be given formal review, but the contributions of new and existing small sources to the total emissions must also be inventoried.

The regulations proposed for this plan would require each new or modified major source to provide information necessary for the determination of the probable emission rate, compliance with BACT, siting analysis under current new source review procedures, and for public information on which to base comments.

This plan would allow each region considerable flexibility on the selection and location of new emitting sources. The amount of new development possible under the emission ceiling depends critically on the degree of emission control applied to both new and existing sources. The ground level air quality at a given point in the region depends on the distribution of sources about that point. It is possible that the development of small residential and commercial sources could be limited because the available emission increment is used by a few large new emitters. It is also possible that ground level air quality could increase to secondary standards in one or more places due to large new sources or source clusters (although this would insure that air quality in the rest of the region would have no deterioration).

The determination of how emission density is to be distributed in each region would be the State's prerogative, and the Administrator would accept any distribution provided that the emission ceiling and national ambient air quality standards are observed. It is strongly recommended, however, that the allowable regional emissions be distributed in some rational and equitable manner so that the best available ground level air quality is maintained, development is balanced between industry, commerce, and residences, and that the review and approval of the sources specified in this regulation precludes the possibility that a few large sources usurp all of the available air resources of the region.

As an example of how this plan operates, assume that an AQCR of 10,000 square mile area has baseline emissions of 40,000 tons/year of sulfur dioxide. The applicable emission ceiling in this case would be 100,000 tons/year. Assume also that existing sources are expected to reduce emissions from 40,000 to 20,000 tons/year by 1980, and that small source growth is expected to equal 10,000 tons/year. The net available emissions through 1980 would amount to 70,000 tons/year. A coal fired power plant of 1,000 megawatt capacity which meets NSPS will emit about 50,000 tons of sulfur dioxide per year. Such a plant could be located in this AQCR, but it would use a large proportion of the available emission allowance. The State would have to balance its need for electricity against other anticipated emission increases to determine if such a power plant was desirable.

if this type of plant was necessary, or if the emissions from the plant should be reduced below NSPS by applying lower sulfur coal and/or more efficient stack gas cleaning equipment.

III. Local Definition Plan

One of the major problems in defining significant deterioration is that the level at which air quality deterioration becomes "significant" is essentially subjective, and is often logically dependent upon a large number of factors which vary from location to location. Accordingly, the proposed regulations supporting this alternative plan would ensure that the rate of deterioration is minimized in all areas and requires State decision-making, with public participation, on the question of whether the deterioration resulting from particular sources would be considered "significant." In order to accomplish this, the regulations incorporate the following four features:

All major new or modified sources would be required to incorporate Best Available Control Technology, as defined previously, thus insuring that deterioration by any major source is held to the lowest practicable minimum regardless of the air quality in the surrounding area.

Any proposed source would be required to submit detailed information to the State concerning the amount and type of emissions anticipated, and the projected impact of those emissions on the air quality in the surrounding areas. The requirement for this type of information is intended to insure that adequate information is available on which to base an objective assessment regarding the significance of any resulting deterioration. Although not specifically required by the proposed regulations, it is anticipated that in many cases the State or local agency would analyze this information in relation to other sources impacting on air quality in the area. This would permit identification of existing sources which could be candidates for additional emission control capable of minimizing or offsetting the potential deterioration attributed to the proposed new source. In any event, the analysis of this type of information would insure that the decisions regarding the significance of any projected deterioration would be based upon the best information available.

The State would be required to make full disclosure of all pertinent information and solicit public participation in the determination of what constitutes significant deterioration. As a minimum, the State would serve public notice of the proposed construction or modification, would make full disclosure of source and State generated information, and would allow at least 30 days for public comment. However, the regulations for this alternative would not preclude the holding of public hearings if the proposal is of sufficient public interest. The intent of this requirement is to insure that the definition of significant deterioration is based upon all pertinent air quality data, the attitudes and goals of the affected population, and the socio-economic conditions and requirements of the affected area.

The State would then determine whether the source would create significant deterioration of air quality. The regulations would provide sufficient legal authority for all States to prohibit construction or modification which could result in significant deterioration of air quality, but pertinent information would also be submitted to the Environmental Protection Agency for review. The Administrator could disapprove the State's determination of what constitutes Best Available Control Technology, or could disapprove the procedures by which the determination of significant deterioration was made, but so long as the required procedures were followed the Administrator would not have authority to reverse the State's judgment of what constitutes significant deterioration in any specific location.

Under this alternative, sufficient information, procedures, and legal authority would be provided to make a valid determination of what constitutes significant deterioration, in the view of the affected public, and to enforce the prevention of that deterioration regardless of any unique circumstances surrounding any individual case. However, sufficient safeguards would be included to insure that a State's determination that the resulting deterioration was not significant could not be used to circumvent other requirements dealing with National Ambient Air Quality Standards, New Source Performance Standards, State emission limitations, or any other legal requirements designed to protect the quality of the ambient air.

This approach has the major advantage that the governmental units and citizens most affected by decisions on maintenance of air quality would make those decisions, based upon conditions existing at that time, thereby ensuring that local requirements and preferences with regard to matters such as land use, economic development, and use of natural resources are taken into consideration. Thus, economic growth would not be arbitrarily restricted to conform to national views on nationwide deterioration, but, rather, would be subjected to State and local decisions as to the form, direction, extent, and distribution of such growth and as to the conditions to be imposed on the construction or modification of facilities which could have a significant impact on air quality.

A somewhat modified version of this plan is currently in restricted use in portions of several States. In these cases, the States have established extremely low ambient air quality standards for selected regions within their boundaries, in most cases to protect State parks, national forests, scenic vistas, etc. This is, of course, within the rights of all States, but many States do not currently have adequate legal authority to prevent construction or modification unless the national ambient air quality standards are threatened. It would, therefore, be necessary to promulgate Federal regulations of the type presented herein to give all States the required legal authority until they can pass suitable State legislation.

Although this alternative is intuitively attractive for a variety of reasons, it is not without drawbacks. There is some justifiable concern that State and local agencies and populations could be subjected to undue pressure exerted by industries desirous of locating within a particular area, and that this pressure could cause definitions of "significant" which might not be in the best long-range interests of these populations. Additionally, the local definition plan uses what is essentially a "sliding baseline" in that deterioration is always measured relative to the current air quality. Hence, there is no control over the ultimate level of deterioration, which could progress in finite increments up to the level of the secondary standards. A final major disadvantage of this alternative is that the long range impact of deterioration is not completely restricted to the local area. The proposed regulations associated with this plan require public comment from within "the area significantly affected by the potential emissions." However, it is entirely possible that the cumulative effects of a large number of "growth-oriented" regions could have a significant impact on the air quality of neighboring "clean-air oriented" regions, and these neighboring regions would thereby lose control over their own environment. Although the feature that the State, rather than the local population, has final authority for the definition of significant tends to mitigate this concern, it nevertheless remains a problem which could lead to inequitable treatment of some areas.

IV. Area Classification Plan

One of the major problems associated with the previously discussed Air Quality Increment Plan involves the possible inequities resulting from establishment of a single air quality increment applicable nationwide. The fourth alternative proposed herein partially alleviates this problem by defining two nationwide air quality increments which would be applied to the appropriate areas of the State compatible with the long range growth patterns and development objectives associated with each of those areas. The application of this proposed alternative would be similar to that of the Air Quality Increment Plan except for the features noted herein.

The proposed regulations would require each State to identify each area of its territory as belonging to one of the two "zones" of allowable deterioration. The following table presents the proposed zones with their associated deterioration increments.

PERMISSIBLE DETERIORATION INCREMENTS (μg/m³)

	Particulate Matter		Sulfur Dioxide		
	Annual	24 Hour	Annual	24 Hour	3 Hour
Zone I	5	15	2	5	25
Zone II	10	30	15	100	300

Deterioration above the Zone II levels would constitute, in the Administrator's judgment, a significant deterioration in most areas of the country. This level is identical to that of the Air Quality Increment Plan and, as discussed under that Plan, would permit a reasonable amount of growth potential so long as well developed air pollution control strategies are applied. This increment would provide a strong incentive for improved control technology, would prevent construction of new sources in locations conducive to higher than normal ground level concentrations, would prevent clustering of major new sources, and would require that both new and existing sources employ increasingly effective control technology in order to maintain a reasonable growth capability for the region. The proposed regulations specify that the Zone II criteria would become effective nationwide upon promulgation of these regulations.

Zone I represents an extremely stringent deterioration criteria, and application of this increment would prohibit the introductoin of even one small fossil fuel fired power plant, municipal incinerator, medium apartment complex (assuming oil heating), or any other medium scale residential or commercial development using normal emission control techniques. However, this does not necessarily mean that development would be totally prohibited: It means only that new emissions would be permitted only to the degree that current emissions are reduced. Strong incentives are therefore inherent for improved emission control technology and introduction of low-pollution development. Although Zone I could be applied to a semi-urban or urban area in which it was desired to inhibit further development; it is anticipated that Zone I would normally be applied to those ultra-clean areas such as national and state forests and parks, and other recreational areas in which it is desired to maintain essentially no deterioration of air quality.

The regulations proposed in support of this plan also contain provisions for exceptions to the required deterioration increments in special circumstances. It could be in the public interest to permit some isolated areas a higher increment in circumstances under which the resulting deterioration would not be considered significant. Each of these cases would require public hearings in the areas involved, and would require specific approval by the Administrator. It is expected that these cases would exist infrequently, but they might occur due to the unusual availability of raw materials in the area; or in order to support comprehensive, long-range development plans; or to avoid the necessity for locating relatively pollution-prone industries near populated areas where a larger deterioration increment might be available. As further insurance that the State's request for an exception is justified, the administrator would consider the extent to which the State has applied Zone I criteria as an expression of good faith efforts to comply with the intent of the proposed regulations.

The proposed regulations require that States accomplish initial zoning within six months from the date of promulgation of these regulations. Retention of the Zone II criteria in an area would be considered the norm, and the degree of public participation would be at the State's discretion. Assignment of Zone I would require that public hearings be held in the region affected due to the severe growth restrictions inherent in the Zone I criteria. If any State fails to submit the required plan, all areas of the State would remain under the Zone II criteria as assigned upon promulgation of these regulations.

Subsequent to submittal of the initial zoning plan, changes in the plan could be accomplished to accommodate changes in growth patterns and development plans; such proposed changes would be presented at public hearings in each of the affected areas.

It is important to note that the proposed regulations would not allow the Administrator to disapprove any assignment of zones made by the State so long as the required procedures are carried out. By requiring the establishment of these zones, and specifying the maximum allowable deterioration associated with each zone, it is not the Administrator's intention to establish how the land in any particular area should be used, nor to establish any particular relationship between current air quality and assigned zoning. Areas assigned to Zone I could retain an option for significant growth capability: The very stringent air quality criteria require only that any growth be restricted to a form which has a low air pollution potential. Use of the land is the prerogative of the State and local population, and hence complete flexibility is provided, consistent with prevention of significant deterioration as appropriate for each zone. In making the determinations necessary to implement this alternative, the States would be encouraged to consider many factors, including but not limited to; growth projections and local land use plans; existing land use; location of raw materials and markets; and existing constraints on land use imposed by other State, local, and Federal requirements.

Unfortunately, as with the Air Quality Increment Plan, the type of air quality data needed to accurately establish the baseline air quality for this alternative is not currently available in many clean areas of the country. It would therefore become necessary to estimate this information by use of diffusion modeling and other appropriate techniques. To eventually alleviate these problems, the plan would establish additional air quality monitoring requirements around new major sources.

Despite the data availability problems, this alternative has some very attractive features. Unlike the other ceiling plans proposed herein, this plan ensures that future developmental patterns can be based on rational planning rather than on previous growth patterns which form the basis for most other ceiling approaches. This alternative also seems superior to the "local definition" plan, in that it is not based on case-by-case local projections of growth patterns which may not be desirable from an overall point of view, but requires that the State establish long range growth patterns and goals. In essence, this plan puts emphasis on longer range strategic planning as opposed to short range case-by-case decisions. The plan also gives States the flexibility needed to meet their long range growth goals without the imposition of arbitrary constraints.

This alternative also has some drawbacks. The proposed regulations require that the State make very difficult and comprehensive decisions impacting on land use in a tight time frame. The results of these State decisions would have far reaching implications on the future of many States. There are no firm criteria which a State may use to make its decisions and as a result, the decisions would be somewhat subjective in nature. The required decisions also would force the States to exercise great care in establishing the boundaries between zones so that the effect of a source in a Zone II does not cause the air quality in a Zone I to increase more than allowed. This problem becomes more severe along State boundaries and would require cooperation among States. Nevertheless, of the available alternatives for preventing significant deterioration, this plan appears to be superior in many, if not all, respects.

OTHER PLANS OF INTEREST

Although the preceding plans (including variations and combinations of these) represent the more feasible alternatives for preventing significant deterioration, the Administrator has given a variety of other plans careful consideration. Two of the more interesting are based upon a volumetric emission density restriction, and application of an emission charge or penalty.

The application of a volumetric emission density restriction is the essential feature of a plan proposed by the Sierra Club. Under this plan, significant deterioration for most pollutants would be defined as either a small incremental increase, or a percentage increase in pollutant concentration, averaged either over that volume of air within one km of the source, or that ground level area within one km of the source, whichever gives the higher value. Although the impact of this criteria is highly dependent upon the instantaneous local meteorological conditions, the philosophy is essentially similar to that of more conventional air quality and emission limitation plans.

The fundamental difference is that the Sierra Club plan considers an exceptionally small area (or volume) on which to base the deterioration criteria. This requires that, in order to restrict regional deterioration to reasonable levels, the allowable increment applied to the one km baseline area must be very small. The result is that this plan would permit a large number of small sources to be uniformly distributed throughout the region, but would completely prohibit construction of conventional coal fired power plants and other major sources of the type listed in the proposed regulations, unless those sources were located in areas in which major improvements in air quality had been accomplished after the baseline level had been established. This feature would tend to drive all new major sources of air pollution into the more heavily populated sections of the country. This anomaly is the result of choosing too small an area (or volume) over which to average the emissions, and is no more a failure of the volumetric averaging technique than any technique in which emission density restrictions are applied to an excessively small area. Conversely, if too large an area is chosen, then the peak concentrations in a local area may become excessive even though total atmospheric loading is reduced. However, the volumetric averaging plan is not proposed herein primarily because the computation technique is unnecessarily complex and is only indirectly representative of the physical characteristics of pollution sources, the baseline data required (particularly for particulates) is largely nonexistent, the monitoring and control costs would be excessive, and simpler plans could be developed to achieve substantially the same results without the practical application problems inherent in the volumetric averaging concept.

A second type of plan containing interesting ramifications but which had to be rejected for practical reasons was one based on the imposition of emission charges. The general reasoning behind such a plan is that secondary NAAQS comprise adequate upper limits on pollutant concentrations, but air quality superior to those limits is desirable. The emission charge would provide a continuous incentive for sources to seek and apply emission controls to minimize their emission charges. The collective effect of these individual cost minimizations would be to maintain air quality at levels superior to NAAQS in most areas. The level of air quality maintained would be a function of the emission charge rate, the development potential of the area, and the state-of-the-art of emission control.

The major advantages of this plan are that the cost of emitting would be "internalized", i.e., it would be taken into consideration in the normal economic appraisal of plant design and location alternatives. Sources would have numerous options as to control method, cost, and degree of control from which to make the optimum choice. The state-of-the-art of emission control would be continuously advanced. Finally, the means of enforcement would be charge collection for which there is ample precedent and experience.

Unfortunately, several problems attend such a plan, particularly in view of the requirement that "significant deterioration" be prevented in any portion of any State. If significant deterioration of air quality is to be prevented by the emission charge, some relationship between the charge rate and the resultant air quality must be found. Such a relationship is not presently available. Even if this relationship were available, the emission charge rate would have to vary from place to place to offset the variation in developmental potential offered by different land areas and the variable capacity of the air to disperse waste under different meteorological and topographical conditions. But most important, an emission charge would not guarantee that significant deterioration could not take place in some portions of some States. Consequently, the emission charge, while possessing some desirable attributes, does not appear to be a practical means of preventing significant deterioration of air quality.

Problems Common to All Deterioration Plans

Jurisdictional Ambiguities—There is a potential jurisdictional problem associated with all plans proposed to prevent significant deterioration. The problem could arise whenever a source in one State is degrading the air quality of a second State. The problem is compounded when small deterioration increments or ceilings are established because a relatively small external source may "use up" a large portion of the growth potential available to the neighboring regions. The region in question would have no apparent resource, and its own growth potential would thereby be curtailed. The recent court order has established the Administrator's authority to prevent significant deterioration regardless of the source's location, but the Administrator has no criteria by which he can dictate whether the allowable deterioration should be allocated to an internal or external source. Hence, in cases such as this, any allowable deterioration increment would have to be allocated on a "first come, first served" basis, regardless of the location of the source.

De Facto Land Use Decisions—It has been pointed out previously that all currently practical plans to prevent significant deterioration essentially impose restrictions on the use of the air resource, and hence, use of land. Depending upon the plan selected, these restrictions would be imposed by local, State, or Federal decisions. However, in all cases, there is a certain amount of flexibility inherent in the regulations regarding land use, and the States are encouraged to exploit this flexibility in order to make most effective use of the available resources. This exploitation is expected to take the form of State legislation permitting State determination of the type and amount of developmental growth authorized to "use" the allowable air quality increment. Complimentary to enactment of this legislation would be long range planning actions to determine the type of growth desired, any constraints on this growth in addition to air quality deterioration constraints, and any additional means for air quality improvements which might, in turn, make possible additional growth. In the absence of such State action, it can be anticipated that the allowable deterioration increment will be used up quite rapidly in many areas, and that this use would be made on a "first come—first served" basis without regard for the longer range requirements and goals of the region. In effect, Federal promulgation of any of the alternatives proposed herein will force States to develop and implement additional land use planning activities through which the available air resource can be allocated for the optimum purposes. These activities will be actively encouraged by the Administrator, and it is planned that eventually the prevention of significant deterioration will be accomplished solely through State Implementation Plan procedures, although such SIPs would have to be in accordance with Federal guidelines.

The Impact of Urban Sprawl—This problem refers to the characteristic trend of most urban areas to spread in to the surrounding countryside thereby creating gradual air quality deterioration due to residential heating and associated small but numerous sources of emission. There is no adequate deterioration plan which can automatically accommodate this deterioration, and yet urban sprawl can use up a large portion of any allowable deterioration increment. The periodic development of emission inventories, and routine air quality sampling, will track the effect of this sprawl, but it must also be projected into the future in order to insure that its impact, in addition to the impact of new major sources, does not violate the deterioration restrictions. For this reason, it may become desirable to include requirements for growth projections in the proposed regulations in a manner similar to those of the recently promulgated complex source regulations.

The Impact of Fuel Switching—Many sources have the capability to switch among various types of fuel—i.e., natural gas, low and high sulfur oil, low and high sulfur coal, etc.—thus altering their emission levels. Although there is generally sufficient low sulfur fuel available, in conjunction with other emission reduction techniques, to attain and maintain the national standards nationwide, there is not currently sufficient fuel of this type (particularly low sulfur coal) to satisfy all potential users. Accordingly, it may become necessary for some sources in relatively clean areas to temporarily switch to higher sulfur fuel in order to make available additional low sulfur